

09/623894
533 Rec'd PCT/PTO 11 SEP 2000

Attorney Docket: 951/49162
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: MARTIN PELLER ET AL.

Serial No.: NOT YET ASSIGNED PCT No.: PCT/EP99/01165

Filed: SEPTEMBER 11, 2000

Title: DATA BUS FOR A PLURALITY OF NODES

SUBMISSION OF SUBSTITUTE SPECIFICATION

*Okay to
Enter*
Commissioner for Patents
Washington, D.C. 20231

Sir:

Attached is a Substitute Specification and a marked-up copy of the original specification. I certify that said substitute specification contains no new matter and includes the changes indicated in the marked-up copy of the original specification.

Respectfully submitted,

September 11, 2000

Vincent J. Sunderdick

Vincent J. Sunderdick
Registration No. 29,004

VJS/rrt

EVENSON, McKEOWN, EDWARDS
& LENAHA, P.L.L.C.
1200 G Street, N.W., Suite 700
Washington, DC 20005
Telephone No.: (202) 628-8800
Facsimile No.: (202) 628-8844

TITLE OF THE INVENTION

Data Bus for a Plurality of Nodes

This application claims the priority of German Patent Application 198 10 291.7, filed March 10, 1998 and PCT/EP99/01165 filed October 3, 1998, the disclosures of which are expressly incorporated by reference herein.

The invention relates to a data bus for a plurality of nodes that are connected to one another via a star coupler. Such a data bus is known from the unpublished German patent application 19720401. Herein, the nodes are connected to the data bus via transmitter/sender modules as long as [said] nodes are operating properly. [Said] bus nodes are active even when they are not required. Depending on the type of application, however, deactivation of the entire data bus may not always be [desired] desirable. After a vehicle is turned off, nodes serving the access control and antitheft protection systems should remain active even though all the rest of the nodes are not required.

The object of the invention is to provide a data bus of the aforementioned [art] type that allows nodes to be selectively

disconnected.

[The object of the invention is achieved by the means of Claim 1.]

[This solution comprises] According to the present invention, a series of individual measures [that] in combination provide the desired effect. In one of such measures, optionally occurring optical signals [in electrical form] are converted to electrical signals and fed as input signals to the star coupler arrangement. [Said] The star coupler arrangement itself [comprises] includes a logical decision gate to which input signals are fed, [and] whose output is connected to the inputs of the nodes in a parallel manner via an electrical line. A switch is arranged in parallel at least at the inputs of [said] the nodes, which are disconnected when required. [Said] The switch can optionally be activated, and interrupts the transmission segment between said decision gate and said node, thus disconnecting said node from the data bus.

[An] In an advantageous development of the invention [is provided in Claim 2. Addressability] the addressability of the switch enables only a single node to be disconnected from the

data bus, if required, in a simple manner.

Finally, such a switch can be assigned to a group of nodes, which can always be connected or disconnected as a unit.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[The invention is further illustrated by means of a] The single figure[. Said figure] shows a detail representation of a data bus according to the invention whereby the mode of transmission of the nodes is monitored.

DETAILED DESCRIPTION OF THE DRAWINGS

At a data bus D are represented two nodes T_n and T_{n+1} that are connected via S/E (transmit/receive) modules S/E_n and S/E_{n+1} . [Said] The S/E_n and S/E_{n+1} modules convert optical messages in electric form received from [said] the T_n and T_{n+1} nodes and relay [signals] these signals Di_n , Di_{n+1} as input signals to a logical decision gate (AND Gate 1) as the central component of

a star coupler K. The number of inputs and outputs of [said] AND Gate 1 corresponds to the number of bus nodes. The output of [said] AND Gate 1 drives all inputs (Do_n , Do_{n+1}) of [said] the S/E_n and S/E_{n+1} modules. [Said] The modules convert these electrical signals into optical signals and transmit same to [said] T_n and T_{n+1} nodes via optical transmission segments[, not shown].

A node can be disconnected from receiving bus communication. To this end, in each output path of the AND Gate 1 is provided an OR Gate 5 whose second input can be set to the high level via an output of a control register 6. [Said] The control register 6 is addressable and is controlled by a serial interface (SPI, for example) of a microcontroller μC .

Thus, a low level can no longer proceed [at] from the output of the AND Gate 1 to the input of the assigned S/E_n or S/E_{n+1} modules. The connected node cannot receive messages, and can remain in sleep mode, for example. With this function, nodes can be disconnected from the bus communication, either individually or in groups.

[Should] When the node [be] is reactivated, the control

register 6 can be deactivated and the OR Gate 5 can once again be made conductive for a low level.

The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and equivalents thereof.

1/PART

09/623894
533 Rec'd PCT/PTO 11 SEP 2000

Clean Specification
PCT/EP99/01165

TITLE OF THE INVENTION

Data Bus for a Plurality of Nodes

This application claims the priority of German Patent Application
5 198 10 291.7, filed March 10, 1998 and PCT/EP99/01165 filed
October 3, 1998, the disclosures of which are expressly
incorporated by reference herein.

09/623894
0012100
150
The invention relates to a data bus for a plurality of nodes that
are connected to one another via a star coupler. Such a data bus
is known from the unpublished German patent application 19720401.
Herein, the nodes are connected to the data bus via
transmitter/sender modules as long as nodes are operating
properly. bus nodes are active even when they are not required.
Depending on the type of application, however, deactivation of
15 the entire data bus may not always be desirable. After a vehicle
is turned off, nodes serving the access control and antitheft
protection systems should remain active even though all the rest
of the nodes are not required.

20 The object of the invention is to provide a data bus of the
aforementioned type that allows nodes to be selectively
disconnected.

According to the present invention, a series of individual measures in combination provide the desired effect. In one of such measures, optionally occurring optical signals are converted to electrical signals and fed as input signals to the star coupler arrangement. The star coupler arrangement itself includes a logical decision gate to which input signals are fed, whose output is connected to the inputs of the nodes in a parallel manner via an electrical line. A switch is arranged in parallel at least at the inputs of the nodes, which are disconnected when required. The switch can optionally be activated, and interrupts the transmission segment between said decision gate and said node, thus disconnecting said node from the data bus.

In an advantageous development of the invention the addressability of the switch enables only a single node to be disconnected from the data bus, if required, in a simple manner.

Finally, such a switch can be assigned to a group of nodes, which can always be connected or disconnected as a unit.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed

description of the invention when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The single figure shows a detail representation of a data bus according to the invention whereby the mode of transmission of the nodes is monitored.

DETAILED DESCRIPTION OF THE DRAWINGS

At a data bus D are represented two nodes T_n and T_{n+1} that are connected via S/E (transmit/receive) modules S/E_n and S/E_{n+1} . The S/E_n and S/E_{n+1} modules convert optical messages in electric form received from the T_n and T_{n+1} nodes and relay these signals Di_n , Di_{n+1} as input signals to a logical decision gate (AND Gate 1) as the central component of a star coupler K. The number of inputs and outputs of AND Gate 1 corresponds to the number of bus nodes.

The output of AND Gate 1 drives all inputs (Do_n , Do_{n+1}) of the S/E_n and S/E_{n+1} modules. The modules convert these electrical signals into optical signals and transmit same to T_n and T_{n+1} nodes via optical transmission segments.

A node can be disconnected from receiving bus communication. To this end, in each output path of the AND Gate 1 is provided an

OR Gate 5 whose second input can be set to the high level via an output of a control register 6. The control register 6 is addressable and is controlled by a serial interface (SPI, for example) of a microcontroller μC .

5 Thus, a low level can no longer proceed from the output of the AND Gate 1 to the input of the assigned S/E_n or S/E_{n+1} modules. The connected node cannot receive messages, and can remain in sleep mode, for example. With this function, nodes can be disconnected from the bus communication, either individually or in groups.

When the node is reactivated, the control register 6 can be deactivated and the OR Gate 5 can once again be made conductive for a low level.

15 The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and
20 equivalents thereof.